

Telecommunications in Michigan An Overview

Most experts would agree that we are in the midst of a technological revolution, propelled by rapid advances in computing and communication systems. We have entered the so-called "information age," where access to accurate and timely information is determining the competitive positions of service groups, manufacturing enterprises, and businesses of all types. Whether a business is concerned with an efficient manufacturing process, a shift in the demand for oil, or the latest agricultural commodity prices in Chicago, information access directly affects the bottom line. Supporting and fueling this increasing emphasis on information access is the telecommunications industry.

Throughout the world today, the telecommunications industry is responding to a rapidly expanding, highly competitive market. The services now offered are so extensive and necessary to commerce that experts use metaphors such as "information superhighway." Telephone companies, once thought of as "sleepy utilities," are now competing in a high-tech global

economy, going well beyond "plain old telephone service" or POTS (Williams, 1991). Telecommunications service and equipment suppliers are offering massive data transmission services, portable phones and beepers, security systems, video-conferencing, telemarketing, television and home entertainment services, and much more.

For many observers, these rapid advances in telecommunications were made possible by federal and state deregulation. Deregulation is said to foster competition and encourage innovation. However, both the industry and the regulatory structure are in a state of flux.

This background is intended to provide a general introduction to the ongoing debate over revising state telecommunications legislation in Michigan. Sections of this brief will explain some of the terminology used and describe the key technologies. We also provide an overview of many concerns and issues raised by participants in the debate. The following section presents a synopsis of the debate leading to the passage of Michigan's first telecommunications act.

In 1986, the Michigan Legislature delegated new power to the state Public Service Commission (PSC) to determine the conditions under which local telephone companies are regulated. Public Act 305 of 1986 gave PSC considerable discretion over regulation and deregulation of telecommunications services. However, the law also included "sunset" provisions. Without new legislation, most sections of the act were to be repealed on January 1, 1992.

In early 1991, the Legislature began debate over Senate Bill 124, proposing a new telecommunications act. After 10 months of discussion and amendments, the bill was enacted and became Public Act 179 of 1991, with an effective date of January 1, 1992. As with the law it had replaced, the new Michigan Telecommunications Act (MTA) includes "sunset" language. Without new legislation, the MTA of 1991 will be repealed on January 1, 1996. Therefore, the Michigan Legislature has begun discussions concerning a rewrite of the MTA during the current legislative session.

Throughout the debate preceding Act 179, supporters of MTA said the new regulatory approach was needed to move Michigan's

communications systems into the 21st century. According to its supporters, the regulatory approach embodied in Act 179 would accelerate the introduction of new technological products and services, increase competition, and result in lower prices. All of these improvements were the expected benefits of greater deregulation of the telecommunications industry in Michigan.

The MTA of 1991 redefined those services offered by telecommunications providers that are regulated by the PSC. Today, PSC regulates fewer than half of those services they regulated in 1991. Further, under the MTA, telecommunications providers can offer a number of new services which are not regulated by the PSC.

Telecommunications providers have welcomed deregulation as an effective step in encouraging innovative new services. Apparently, telecommunications companies envision a comprehensive communications system within the home, combining the phone, cable, and computer functions (voice, video, and data) all on one wire. The new

technology would allow communications connections with schools, offices, and even shopping and consumer services.

The term “telecommunications” refers to the “transmission of information over a distance by an electrical or electromagnetic system. This information may take the form of voice, data, image, or message” (Azarmsa, 1993). For example, telecommunications includes communicating with another person by phone (voice communications or *telephony*). Words are transmitted over telephone networks. These networks comprise both local or long distance services (Azarmsa, 1993).

Data communications is another form of telecommunications that involves transmitting data from one computer to another. These computers may be separated by great distances. Video images may also be transmitted by electronic means by using the electromagnetic spectrum (i.e., television broadcast) and through wire or cable connections (i.e., cable television).

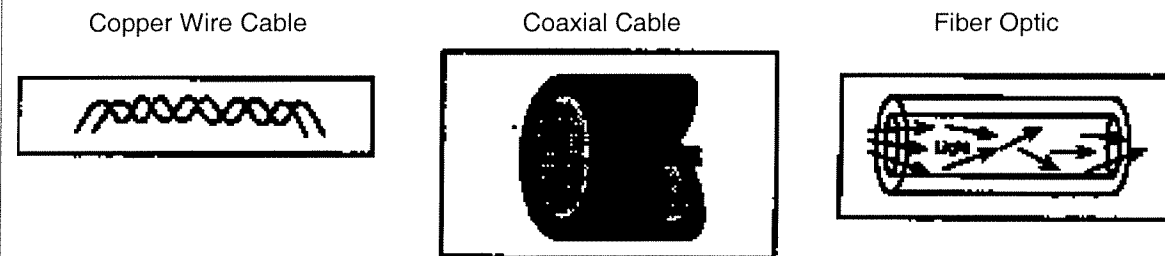
In recent years, the various forms of telecommunications have increased the efficiency and

capabilities of transmissions. For example, computers and video imaging have converged into what is now called *telematics* while computers and voice systems have been combined as computer *telephony*.

Basic telecommunications systems consist of three elements: a transmitter, the information to be transmitted, and the receiver. The telephone is telecommunications at a basic level. Standard telephones have several components, including: a *transmitter* which converts voice vibrations to electrical impulses; the *telephone wire* over which those impulses are transmitted; and, the *receiver* which converts the incoming electrical impulses to sound. The telecommunications system also includes a *switching* mechanism that connects callers with receivers.

Building on these basic principles, the telecommunications industry has developed new technologies which now encompass the transmission of data and video as well as voice. Rapid progress is also being made in providing these services more efficiently, at higher speeds, and over greater distances.

Figure 1. Examples of Transmission Media
(Source: US GAO, 1994).



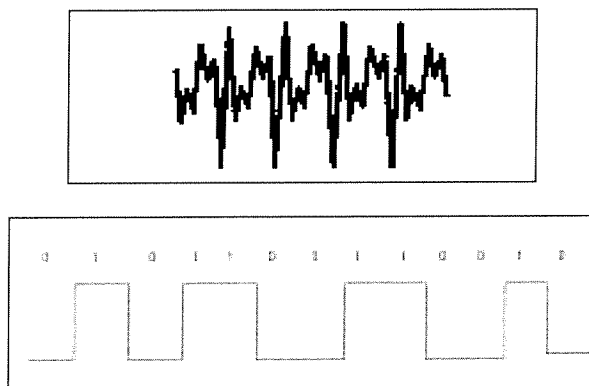
Transmission

Information may be transmitted from the sender to the receiver in several ways (see Figure 1). Traditionally, phone companies have used *copper wire (twisted pair wire)* for transmission purposes. Copper wire is convenient and inexpensive, but has a number of drawbacks. For example, it is not particularly secure (i.e., the line may be easily tapped) and is susceptible to damage by weather. Further, copper wire can carry a signal for only one to four miles before the signal becomes weak and must be strengthened with a *repeater*. Other modes of telecommunication transmission include: coaxial cable, fiber optics, satellites, and microwave.

- **Coaxial Cable.** Coaxial cable consists of a single copper wire conductor surrounded by an insulator and a hollow copper cylinder. Coaxial cable provides high capacity transmission, including cable television, voice, and data communications. Higher frequencies can be carried by coaxial cable than a copper wire. A single coaxial cable can carry 3,600 voice channels. However, like copper wire and microwave signals, security may continue to be a concern.

- **Fiber optic lines.** A fiber optic is a wirelike strand made of glass, about the diameter of one human hair. The fiber is encased in a protective cover and is considered very compact and rugged (PSC, Undated). These fibers carry pulses of light. These pulses represent the programmed, digital signals

Figure 2. Analog (top) and Digital Signals (bottom)
(Source: US GAO, 1994).



used by computers. The use of computer code contained in pulsed light transmissions supports the transfer of large amounts of information over great distances. For example, a seven mile piece of fiber can transmit twenty-five million words of text every second without amplification (Azarmsa, 1993).

- **Satellites.** Satellites are placed in orbit above the earth and receive signals from locations on the earth's surface. These signals are then retransmitted to a receiving station on the earth's surface (a satellite dish). Satellites can handle several thousand voice circuits. Although traditionally a very costly method of transmission, costs are declining (Azarmsa, 1993).

- **Microwave.** Microwave signals are used primarily for certain radio transmissions. Microwave signals can carry high volumes of information (e.g., many phone conversations at once). However, these signals are limited to a "line-of-sight"

transmission from sender to receiver. In addition, repeaters are needed after 30 miles. Finally, securing the transmission against unauthorized use is difficult with microwave. Signals must be scrambled or encrypted to reduce this threat (Azarmsa, 1993).

Analog versus Digital Transmission

Information may be transmitted in modern telecommunications systems as electrical signals. These signals may be in the form of a continuous cycle, or electromagnetic wave, referred to as "analog." Another form the electrical signals may take is that of electronic pulses, commonly called "digital." As depicted in Figure 2, digital signals are represented by ones and zeroes or referred to as "on" or "off" (US GAO, 1994). More and more of today's transmissions are sent in digital form. An advantage to using digital transmissions is that these transmissions are less susceptible to interference and noise than analog signals. Additionally, digital signals can

be originated and stored directly by computers (Azarmsa, 1993).

Bandwidth

According to Reza Azarmsa (1993), a telecommunications expert, bandwidth is:

[t]he range of lowest and highest frequencies that are transmitted. The wider the bandwidth, the more information (video, audio, data) transmitted in a given period of time.

Today, three bandwidths are used for transmissions: narrow band, voiceband, and broadband.

The narrowband is used for carrying very slow data (computer) signals. Some voice transmissions may also be found in this bandwidth (Azarmsa, 1993; Williams, 1991). Voiceband carries both voice and data transmission. Broadband has a greater bandwidth than either narrow or voice band and therefore can carry more information. In this range, high-speed data and video transmissions are carried.

Switching

The first electrical communication systems (telegraphs) used "point-to-point" communications. That is, the message was sent across a wire from point A to point B. With just a few points to connect, this approach worked well. However, as more users and wires were added to the system, the process of connecting one sender/receiver to another sender/receiver became too complex and cumbersome (Williams, 1991). This problem is illustrated in Figure 3.

By connecting all users to a central location rather than to each other, the phone companies were able to make a larger number of connections between a larger number of users. The central location, referred to as the "switch," routes calls and establishes connections between one user and another.

The earliest switch was the *switchboard*. At that time, the switchboard operator physically connected and disconnected users of the system by hand. Modern switches are computer-based systems that route calls in the most efficient, least costly manner while keeping records of all calls made (Williams, 1991).

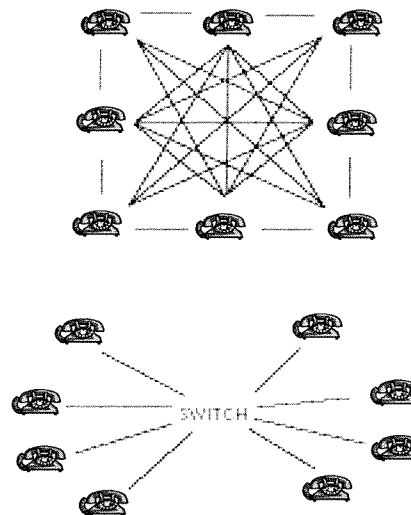
Telecommunications depends on the use of special electronic hardware. Hardware such as transmission lines and switches have been installed all over the state to sup-

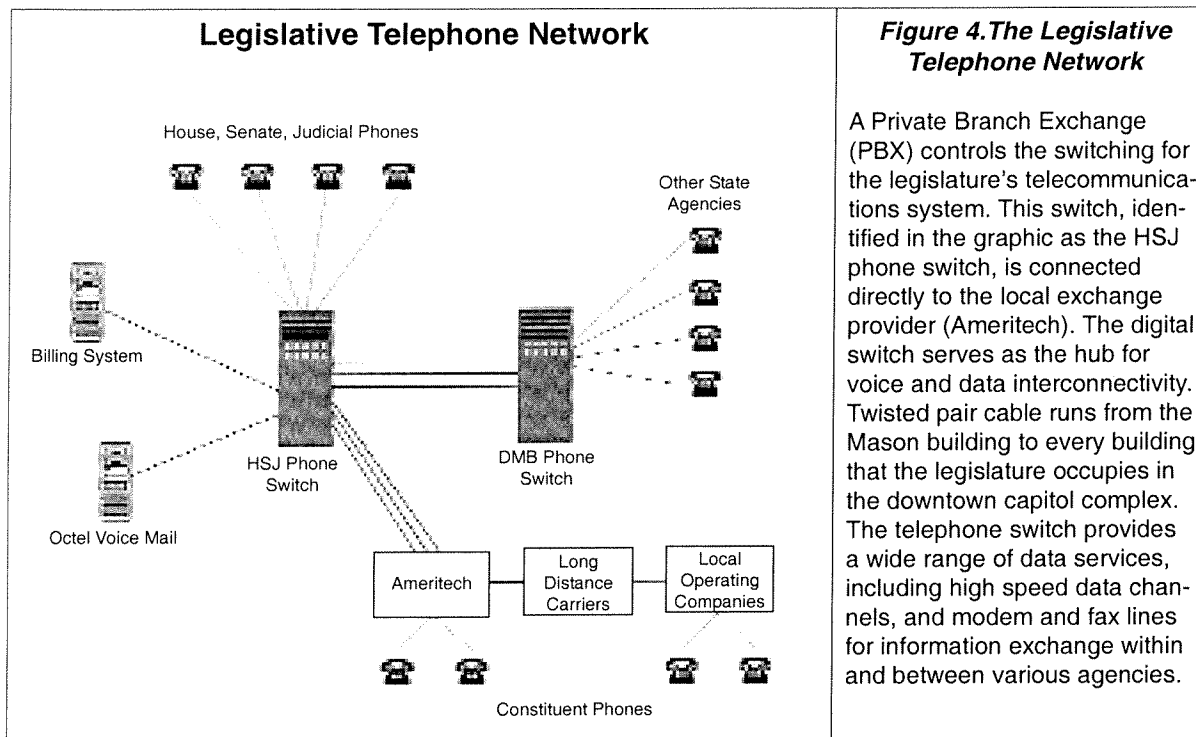
port the telecommunications system. Much of this hardware has been installed by local basic exchange companies, such as Ameritech and GTE-North – the two largest local exchange providers in the state.

Some large organizations have installed their own hardware and operate their own private telecommunication systems. These private systems include a local switch, computer hardware and software, telephones, and telephone access lines. These private branch exchanges (PBXs, illustrated by the HSJ phone switch in Figure 4) connect to the larger, statewide telecommunications system through a local exchange provider.

An example of the hardware installed by the local exchange provider is the access line. An access line is the actual connec-

**Figure 3. Point-to-Point Connection (above) and Central Switching (below)
(Adapted from Williams, 1991)**





tion the phone company makes into a home or business. According to PSC, the total number of access lines in the state is approximately 5.2 million. The largest owner of access lines is Ameritech, making it the largest local exchange provider in the state. The smallest local exchange provider in 1993 was Ogden, Inc., with 407 access lines (Bradshaw, 1995b). The table to the right shows the number of access lines owned by the 5 largest local exchange providers in the state.

Telecommunications companies, other than local exchange providers, wishing to provide service to a home (e.g., long distance companies) do not own actual connections to a residence. Instead, these companies pay the local phone provider to transmit over the existing access

line. Therefore, a great deal of the hardware may be owned by the local phone provider, although services may be provided by multiple companies.

The PSC is established by Public Act 3 of 1939 to "provide for the regulation and control of public utilities and other services affected with a public interest..." (MCL 460).

The PSC consists of three members who are appointed by the governor with the consent of the senate. Commissioners serve for 6-year terms, which are staggered to assure overlap. The Commission is given the authority to regulate certain aspects of telecommunications services in the state under the MTA (1991 PA 179).

Michigan's Largest Local Exchange Providers Calendar Year 1993

<u>Company</u>	<u>Approximate # of Access Lines</u>
Ameritech	4,431,000
GTE North Inc.	562,000
Century Telephone	73,000
GTE Systems Inc.	45,000
Frontier	20,000

Rate Regulation

One of the primary regulatory concerns of the PSC is the cost of access or rates charged by the service providers. Three groupings of rates are regulated by PSC: local service rates, access rates, and toll rates.

Local Service. According to PSC, 39 companies in Michigan provide basic local exchange service. Basic local providers offer over 400 local services. Approximately 189 of these services are "regulated" services requiring PSC approval for rate changes.

Access Service. Access service is the link between a residence and the switching equipment of a long-distance company (Quigley, 1994). PSC defines access services as "those services and facilities provided to enable all providers and customers to originate and terminate any intrastate telecommunication" (Commission order in Case No. U-10064, dated December 22, 1992). The PSC approves access service rates only in cases where the rates exceed rates set by the Federal Communications Commission (PSC, 1993).

Toll Service. Toll service is defined in the MTA as "the transmission of 2-way interactive switched communication between local calling areas..." (PSC, 1993). Toll service may include both IntraLATA and InterLATA. A LATA is the *Local Access and Transport Area*, or the geographic area in which a local exchange provider is permitted to provide service. IntraLATA long distance calls are those calls which remain

within the LATA, but are considered long distance (e.g., Lansing to St. Johns). InterLATA calls are those placed from one area code to another or from one LATA to another LATA (e.g., Lansing to Detroit). Ameritech and GTE-North are the only local exchange carriers that also provide long distance service within a LATA. InterLATA service is provided by AT&T, MCI, SPRINT, and many others.

When a company wishes to change a regulated rate, it files a request for a hearing of the PSC. After reviewing rate change requests, the PSC will write an "order" detailing how the rate change will or will not take effect.

Regulated Services

The PSC regulates the three types of rates noted above as well as certain services. Prior to the passage of the MTA in 1991, a total of 445 services provided by phone companies were regulated by the PSC (PSC, 1993). A number of these services were deregulated under Public Act 179. Those services that remain regulated are considered by PSC to be "basic to health, safety, or general welfare of the citizens of Michigan" (PSC, 1993). This definition encompasses a broad range of "services," including activities and functions necessary to operate local phone systems. For example, touch tone service is regulated as are four different types of touch tone service (i.e., business and WATS, Residence, PBX, and Centrex). In addition, regulated services may overlap in several areas. For example, exchange rates are

termed "regulated services" and are further broken into business services and residence services for a total of seven regulated services under this category (PSC Case No. U-10064).

As of January 1992, local services regulated by PSC totaled 189. Not all local exchange providers offer all 189 services. According to PSC, Ameritech offers the largest number of regulated services at 12, GTE offers 4 (PSC, 1993).

Prior to MTA of 1991, local exchange providers were assigned exclusive territories by the PSC. However, the new law was designed to open up these exclusive areas to possible competing providers. In 1994, the PSC granted U.S. Signal Corporation in Grand Rapids a license to provide basic local exchange service within an area already serviced by Ameritech. This is the first license to be granted for a competitor within any of Michigan's local exchange territories. For U.S. Signal to provide local service in the Grand Rapids area, it will need to connect to the existing Ameritech facility. In February 1995, PSC released a ruling detailing the rates Ameritech may charge for this connection. U.S. Signal will not have exclusive territory, but is considered a "competing licensee" (Bradshaw, 1995a).

In addition to the local exchange providers, a number of long distance companies operate in the state. The PSC regulates the services provided by eight companies which own transmission facilities in the state of

Michigan. However, the state does not regulate the services provided by "resellers," those companies which do not own transmission facilities in Michigan. Resellers buy bulk transmission time from companies with facilities in the state and resell it to the public (Balasia, 1995; Bradshaw, 1995a). Apparently, it is difficult to track the number of resellers. Michigan-based phone companies may do business with a number of different resellers. For example, at one time PSC recorded 74 resellers who claimed to do business in Michigan. Yet, Ameritech identified 102 resellers and only 9 of the resellers on Ameritech's list were also recorded on PSC's list (PSC, 1993).

Several telecommunications industries and the services they provide are not regulated by the PSC. For example, the cable television industry and the cellular or mobile industry are not regulated by the PSC.

Unregulated Services

A number of services provided by the phone companies were *deregulated* with the passage of MTA. These are services that PSC does not consider essential or necessary. Deregulated services may include custom calling features such as call forwarding, three-way calling, and call waiting.

Under Act 179, phone companies are able to bring new, unregulated services to the market without obtaining PSC's approval of rates. Additionally, companies can change the current rates charged for unregulated services without PSC approval.

Traditionally, phone companies were the main providers of our communications system. However, over time, advances in technology have made it possible to transmit more than voice from one location to another. Text, data, and video are commonly sent great distances across wire or other means of transmission. New

technologies have spawned new types of telecommunications companies offering these services. For example, cable television companies and cellular phone companies offer telecommunications services outside the realm of the traditional phone company.

Cable Television

Cable television traditionally uses coaxial cable to send programs into the subscriber's home. The original program may first be sent via satellite or microwave facilities before arriving at a subscriber's home over coaxial cable. Unlike the telephone network which is universally connected, cable systems are not interconnected with each other. Additionally, the cable connection is traditionally a one-way transmission of information, unlike the telephone's two-way transmission of information. However, the use of fiber optic wire for cable television will allow two-way transmission. For example, voice, video, and data can be transmit-

Telecommunications companies continue to expand the services and technologies available to consumers. New services or technologies recently offered or expected in the future are listed below:

- *Personal communication services.* The customer has one phone number that is used no matter what location and moves when the customer moves.
- *Distance learning.* A telecommunications link connecting schools to experts or resources at remote locations, providing greater access to a diversity of learning tools.
- *Integrated Services Digital Network.* A network that would transmit signals completely in digital form without having to convert the signal to analog format. This concept would replace computer modems.
- *Synchronous Optical Network.* A synchronous optical network will improve the efficiency and quality of services delivered over fiber optics. This network would support high bandwidth applications.
- *Asynchronous Transfer Mode (ATM).* ATM will enhance multiple service needs such as the combined transmission of voice, video, and data. ATM offers high speed digital switching.

ted at the same time over the same fiber optic wire both into and out of the home (Quigley, 1994).

Cellular Telephone

Cellular telephone systems use a combination of wire and nonwire (i.e., microwave signals) facilities to transmit calls to and from phones. In general, two components of a system emit microwaves: stationary antennas called *base station transmitters* and mobile *cellular telephones*. The area serviced by a base station transmitter is called a "cell." The base station transmitter relays phone messages, via microwaves, between mobile phones within a cell. When a phone user in one cell makes a call to a person in another cell, the signals are relayed between

the base stations. The base station transmitter has physical wire connections to switching equipment allowing calls to be transferred to "wire" phone systems as well.

An estimated 13.5 million people subscribe to cellular phone service in the nation. The cellular service providers with the largest number of subscribers nationally are reportedly McCaw and GTE/Contel (Quigley, 1994).

Computer Telephony

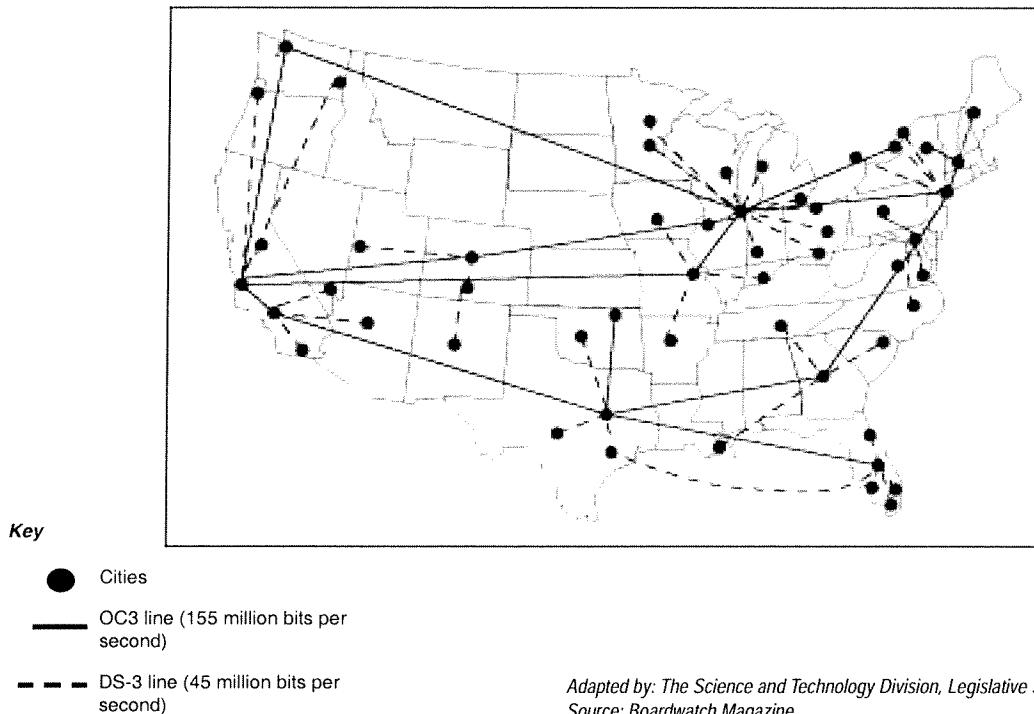
The term "computer telephony" refers to recently developed technologies that merge personal computers and desktop telephones. One author describes this as "adding intelligence to telephone calls" (Newton, 1994). By merging your office or home telephone with a computer, all

phone transmissions can be programmed through computer software. For example, software and hardware are available for personal computers that allow the computer to be programmed to handle such services as faxing, voice mail, speed dialing, teleconferencing, and call forwarding through the phone line.

The Internet

Generally speaking, the Internet is a network of computers providing a link between academia, government, and industry around the world. Although originally established by the United States Department of Defense, the Internet currently connects more than 500,000 host computers in 33 countries. Internet users have access to

National Internet Backbone of Selected Company



Adapted by: The Science and Technology Division, Legislative Service Bureau
Source: Boardwatch Magazine

electronic mail (e-mail) and chat-line services and may search numerous databases and library catalogs worldwide. Document transfers from remote computers to host computers are also possible on the Internet.

Access to the Internet requires a computer and a physical connection. Connection may occur through telephone lines, cable television, satellite links, wireless phones, or fiber optics (*Business Week*, 1994). As more individuals and companies become connected, more information and services are available through the Internet. Some believe the Internet is the front runner of interactive television. The Internet is being used as an experimental medium for services such as electronic shopping, banking, and publishing (*Business Week*, 1994). Some companies are even considering linking paging services to the Internet (*Business Week*, 1994).

In addition to the need for a computer and physical connection to access the Internet, users also need an Internet *address* and a means to pay for the connection. A cost may be incurred by the user for the computer, a line connection, an Internet address, and *online time* while using the Internet. Although a standard phone line can be used to access the Internet, the point of access or *node* may not be available locally. Some users might have to dial long distance to connect. Addresses are available in some parts of the country through "freenet" services that provide free access to the Internet. However, if a freenet is not available, users may have to

subscribe to a service that charges for Internet access.

Telecommunications services and providers are regulated at the federal level by the Federal Communications Commission (FCC) under the Communications Act of 1934. Congress has not rewritten the federal Communications Act of 1934 since its enactment. However, parts of the Communication Act of 1934 have been revised through legislation and court orders. For example, a Modification of Final Judgement (MFJ) issued in 1982 by Judge Harold Greene set the terms and timing for the dismantling of AT&T. The MFJ restricts the Regional Bells (e.g., Ameritech) from operating in the long distance market and protects the Regional Bells from competition in local markets (Miller, 1995; Neumann, 1994; Thierer, 1994).

Following the MFJ, Congress passed the Cable Act of 1984 prohibiting phone companies from providing cable services and cable companies from providing phone services (Miller, 1995).

In 1994, two pieces of legislation were introduced in Congress to rewrite the 1934 Act and change the way the telecommunications industry and phone companies in particular are regulated. Under the proposals, Congress considered allowing the Regional Bells to provide long distance service (Thierer, 1994). Additionally, the legislation would have allowed competition between telephone and cable companies. According to experts, the proposed legislation

was the closest Congress has come to updating the Communications Act of 1934 (BNA, 1994). However, both proposals "died" at the end of session in December 1994.

The new Congressional Session began January 1995 and two new draft telecommunications bills are being circulated. Senator Larry Pressler (SD), chair of the Senate Commerce, Science, and Transportation Committee, released a draft bill on February 1 that is designed to open competition in all markets within three years and eliminate all restrictions in the MFJ (BNA, 1995). As with previous legislation, this bill would allow the Regional Bells to enter long distance markets once they can show that local markets are open to competition. Therefore, the bill would also encourage competition in the local markets for phone service. In three years, the MFJ would no longer be in effect.

Similar legislation has been introduced by Senator Ernest Hollings (SC). Both Senators were the sponsors of telecommunications bills that failed in the previous congressional session.

The entry of Regional Bells into the long distance market raised concerns with the telecommunications bills in the past session. Apparently, the Regional Bells want long distance markets opened with few restrictions or regulations. However, the long distance companies do not want the Regional Bells in the long distance market until the local markets have been opened. According to long dis-

tance companies, the Regional Bells have information on residential telephone customers that can provide them a competitive advantage in the long distance market (BNA, 1994).

Another issue at the federal level concerns the expansion of local telephone providers into the cable television market. This is currently prohibited under the Cable Act of 1984. However, telephone companies are interested in providing several services on a single wire going into the home, including video services (Miller, 1995).

Universal service, a concept included in the Communications Act of 1934, is also part of the federal telecommunications debate. Universal service assures that telephone connections are available to virtually every home in the U.S. For example, 96% of the homes in Michigan have telephone service, a result of universal service requirements. To help achieve universal service, costs are kept artificially low in some areas of the country so that telephone service remains affordable. That is, pricing may be regulated to spread the actual costs more uniformly across user groups. However, the proposed changes in the telecommunications law may do away with universal service (Miller, 1995).

The proposed amendments introduced in the last session of Congress included provisions to take away local and state government control of public rights-of-way. Local governments are concerned that removing this control will result in unplanned and uncontrolled disruption of

the streets and safety issues as companies lay cable and wire wherever they want (Newcombe, 1995). On the other hand, the telecommunications industries see the high costs of accessing public rights-of-way as hampering their efforts to connect with the public (Clift, 1995).

Many people interested in telecommunications issues in Michigan believe that the MTA of 1991 provided the proper atmosphere for dealing with conflicts, encouraging competition, and assuring universal access. However, issues remain unresolved in several areas, including interconnection agreements, government-protected monopolies competing in the market, public access to the Internet and a Michigan information network, and distance learning and other educational issues.

Interconnection

Transmission lines that run directly to a residence or business are often owned by the local service provider. A "competing" company that wants to provide local phone service to that home or business has to connect to the existing line or run its own line. Interconnection agreements would determine how the connections would be made between competing service providers and customers. To date, one company in Michigan has received a "competing license." However, the interconnectivity agreement became an issue of contention, delaying the company's entry into the local market.

Monopoly Providers

Many telecommunications companies that compete in the open market are concerned that local telephone providers are entering the competitive service market while maintaining a monopoly on local phone service. Opponents argue that this activity is funded with ratepayer dollars obtained through a government protected monopoly, giving the local phone provider a competitive advantage. Opponents believe that the local phone providers should not be allowed in the competitive services until the local phone market is opened for competition (Brogan, 1995; Miller, 1995a, Vanderveen, 1995).

Some consumer groups also oppose the entry of local providers into the competitive services market. Some consumer groups are concerned that ratepayer dollars will be used to upgrade the hardware (e.g., the access line) connecting a residence to the phone company. These upgraded lines can then be used to provide additional services, services that may not be considered necessary or essential. Some consumer groups oppose the use of ratepayer dollars to provide those services not basic to local phone service (Stoddard, 1995).

However, the local phone providers are concerned that other companies are being allowed into the local phone market (e.g., U.S. Signal) without a reciprocal opening of markets (The New York Times, 1994; Quigley, 1994).

Internet Access

Accessing the Internet requires a number of items, including a computer, a physical connection, and an Internet address (for most services). The services that can be accessed through the Internet are considered by some to be at the forefront of the telecommunications industry. For example, information on current legislation pending in Congress can be obtained online. Documents released by the Governor's office in Michigan are also available over the Internet, as is the Department of Natural Resources' biweekly calendar of permit activities. However, a relatively small percentage of the population has computers and access to the Internet. Universal access as it relates to the Internet may be an issue of discussion.

Distance Learning

Connecting schools and learning institutions to resources in remote locations through telecommunications (e.g., teleconferencing or computer hookups) would provide a number of students with enhanced learning tools. The manner in which these connections take place may be a discussion point in the rewrite of the MTA. Local Access and Transport Area (LATA) boundaries may limit the ability of local exchange providers to offer distance learning connections. LATA boundaries define the geographic area in which service may be provided by a local exchange provider. Local exchange providers are unable to offer services between two towns if those towns are in

different LATAs (i.e., interLATA calls require a long distance company to complete the connection). Therefore, directly connecting a school with a remote location may not be possible for a local exchange provider (Quigley, 1994).

The cost of a distance learning connection is also a concern. Should local providers be allowed to make these connections or should a competitive market approach be followed?

During the 103rd Congress (1994), progress was made on a major rewrite of the federal Communications Act of 1934. The legislation proposed in 1994 covered a number of issues that are of importance to the state, including opening local phone markets to competition, allowing phone companies and cable companies to compete, control of public rights-of-way, and universal service. Congressional activity on rights-of-way and universal access may limit state and local control of telecommunications. Although this legislation did not pass in the 103rd Congress, new legislation has been introduced this year addressing many of the same topics.

REFERENCES

Anderson, Fred. State Director for Government Relations, AT&T. Lansing, Michigan. Personal Conversation. February 3, 1995.

Azarmsa, Reza. *Telecommunications: A*

Handbook for Educators. Garland Publishing, Inc. New York. 1993.

Balasia, Steve. Director, State Government Relations, Ameritech. Lansing, Michigan. Personal Conversation. March 2, 1995.

BNA Antitrust and Trade Regulation Daily. "Pressler Releases Draft of Telecommunications Bill." Washington, D.C. February 16, 1995.

BNA Management Briefing. "From Hours of Discussions to Non-negotiable Demands: The History of the Failed 1994 Telecommunications Bill." Washington, D.C. November 28, 1994.

Bradshaw, Howard. Communications Engineer, Communications Division, PSC. Lansing, Michigan. Personal Conversation. January 1995a.

Bradshaw, Howard. Communications Engineer, Communications Division, PSC. Lansing, Michigan. Personal Conversation. February 1995b.

Brogan, Leslie. Public Sector Consultants. Lansing, Michigan. Personal Conversation. February 1995.

Business Week, "Phone Frenzy: Is There Anyone Who Doesn't Want to be a Telecom Player?" February 20, 1995.

- Business Week. "The Internet How it will Change the Way You Do Business." November 14, 1994.
- Clift, Marty. U.S. Signal. Grand Rapids, Michigan. Personal Conversation. February 1, 1995.
- Choura, Ron. Deputy Director, Policy Division, PSC. Lansing, Michigan. Personal Conversation. March 1, 1995.
- Miller, Brian. "Telecommunications Reform Returns to Congress." Government Technology. February 1995.
- Miller, Robert. American Kaytell. East Lansing, Michigan. Testimony before the Joint Legislative Committees on MTA. February 22, 1995a.
- Neumann, Peter G. "Computer Insecurity." Issues in Science and Technology. Fall 1994.
- Newcombe, Tod. "State and Local Governments Want Bigger Role in Telecom Reform." Government Technology, February 1995.
- Newton, Harry. "The Ultimate Telephony Slave." Computer Telephony. September/October 1994.
- Noack, David. "Libraries Provide Universal Access to Information Highway." Government Technology. August 1994.
- Public Sector Consultants, Inc. Fiber Optics: Toward an Estimate of Costs in Michigan. Lansing, Michigan. Undated.
- Public Service Commission. Report on the Impact of Public Act 179 on Telecommunication Service Providers and Customers. Lansing, Michigan. 1993.
- Quigley, Philip J. "The Time has Come to Open the Long-Distance Market." Issues in Science and Technology. Summer 1994.
- Stoddard, Rick. Michigan Consumer Federation. Lansing, Michigan. Personal Conversation. February 23, 1995.
- The New York Times. "MCI Seeks to be 'Local' In 5 States." October 4, 1994.
- Thierer, Adam D. "Don't Settle for Partial Phone Deregulation." Issues in Science and Technology. Fall 1994.
- United States General Accounting Office. "Information Superhighway: Issues Affecting Development." Washington, D.C. September 1994.
- Vanderveen, Terr., U.S. Signal: Grand Rapids Michigan. Testimony before the Joint Legislative Committees on MTA. February 22, 1995.
- Williams, Frederick. The New Telecommunications: Infrastructure for the Information Age. The Free Press: New York, NY. 1991.

Telecommunications in Michigan Update 1995 to 2002

The Michigan Telecommunications Act (MCL 484.2101 et. seq.) regulates local telephone services provided to residential and commercial customers in Michigan. In 1995, the Michigan Telecommunications Act (MTA) was amended to deregulate many telephone services provided by local service providers and encourage competition in local markets. Carriers no longer have to file a rate change request with the PSC before raising or lowering rates related to deregulated services.

Public Act 216 of 1995 further deregulated the industry by providing for interconnection with basic local exchange service. Interconnection allows companies to provide local phone service in areas where

other providers own the lines. The Act required local providers to unbundle local exchange services so that these could be separately priced and offered to other providers for purchase.

Public Act 216 addressed the issue of number portability, requiring local providers to allow customers to take their phone number with them when changing providers beginning in 1999 (see box below).

The amendments also provide for alternative dispute resolution processing and include the provision that a telecommunications provider may deregulate its rates if a competitive market exists for the rate-regulated service. There are criteria defining competition, subject to MPSC review and alteration. Additionally, the

In 1996, Congress directed local telephone companies to offer "telephone number portability," the ability for customers to switch phone companies, but keep their existing phone number at the same location. Proponents of number portability believe customers are more willing to switch between phone providers if they can retain their phone number, thereby increasing competition and providing customers with greater choice. To cover the costs of implementing and providing number portability, phone companies were allowed to collect end-user charges beginning in February 1999 in those areas where number portability is available.

Number portability is first being implemented in major metropolitan areas. A new company providing local service may request that the incumbent local telephone company offer number portability in their service area.

amendments require local service providers to offer a number of local calling plans to customers if technically feasible. The law provides for new regulation of payphone services and operator service providers. It also provides for consumer protection against *slamming* and protection of privacy where a telephone number is unlisted. (*Slamming* is the switching of a consumer's telephone provider without his or her knowledge.)

Public Acts 95 and 96 of 1997 modified the MTA to require providers of telecommunications services within the state that receive federal universal service support to provide elementary and secondary schools, and libraries with discounted intrastate services. These discounts would be equal to the discounts applicable for eligible interstate services. In 1997, the MTA was also modified by Public Act 183 providing additional rate reductions for low-income residential customers.

In 1998, Public Acts 259 and 260 amended the MTA to provide additional protection against *slamming* by telephone companies.

Some experts do not believe that the 1995 deregulation has increased competition in Michigan. Others have stated that rates for local phone services are higher in Michigan than neighboring states. The Michigan Public Service

Commission (MPSC) testified at a hearing in the House of Representatives on May 10, 2000 that little competition exists in the Michigan telecommunications industry. In addition, the MPSC has minimal authority to address the lack of competition.

The Michigan Legislature enacted Public Act 295 of 2000 to address concerns about the lack of competition, phone rates, and MPSC authority. Several changes were made to the MTA under Public Act 295.

- The purpose of the MTA was amended to read as follows: “[T]o ensure that every person has access to just, reasonable and affordable basic residential telecommunication service.”
- The MPSC is provided the authority to take action on disputes between service providers in a more timely manner. An emergency relief order would require a service provider to establish or continue providing a competitive service or refrain from establishing or providing a competitive service while a complaint is

being addressed. This measure would protect customers while an issue is being debated. In addition, an order granting or denying emergency relief is subject to immediate review by the court of appeals.

- The MPSC may grant licenses to provide local phone service if providers meet certain requirements. One requirement maintains that a provider intends to provide service within 1 year from the date the license is granted. The MPSC may revoke a license if within 2 years the provider has not marketed services to all potential customers or has refused to provide services to certain customers.
- Monthly intrastate subscriber line fees levied by larger phone companies will be eliminated (see gray box).¹
- Phone rates are capped at May 2000 levels for three years.¹
- Area codes are to follow county boundaries as much as possible.

The Federal Communications Commission (FCC) gave local telephone companies authority to charge fees for the use of their network by long distance companies. These interstate access charges are regulated by the FCC. The Michigan Telecommunications Act (MTA; 179 of 1991, as amended) provided local telephone companies the authority to establish intrastate access charges at the same level as the federally established interstate access charges (MCL 484.2310(2)).

This flat monthly fee on each line is paid by the end-users (consumers) and is referred to as a “subscriber line charge” or “End-User Common Line (EUCL) charge. The state regulated subscriber line charge was eliminated for local telephone providers with more than 250,000 customers by the Michigan Legislature when the MTA was rewritten in 2000 (MCL 484.2310(8)). This amendment took effect on July 17, 2000. Two local providers challenged the elimination in court.

•Phone calls made to *adjacent local calling* areas are to be considered local calls.¹

•MPSC has authority to approve or deny proposed changes and modifications of area codes in the state.

•Certain rate increases are subject to customer notification and possible MPSC review.

•Long distance companies must eliminate monthly minimum fees for customers in Michigan.

•Until Directory Assistance service is competitive, the MPSC shall regulate rates, if any, and the quality of Directory Assistance service.

•MPSC is to assign the digits “211” as community resource information and referral services in various geographic areas around the state. The digits “211” are part of a comprehensive network of referral services to ensure that all citizens have the opportunity to have basic needs addressed. These services would be different than life threatening situations (a person in need would call 911).

Court Challenges

Public Act 295 took effect July 17, 2000 and addressed a number of services provided by local telephone companies. However, local telephone companies challenged three provisions of Act 295. Specifically, SBC (Ameritech Michigan) and Verizon (formerly GTE) filed suit in U.S. District Court challenging the following three provisions of Act 295:

•the freezing of local telephone rates at their May 1, 2000 levels,

¹ These provisions were challenged in court by local telephone providers.

- the elimination of the intrastate subscriber line fees (end-user common line, EUCL, charge) charged by local telephone companies, and
- considering calls to adjacent local calling areas to be local calls.

On September 14, 2000, U.S. District Judge Paul Borman issued a temporary injunction lifting the rate freeze portion of the law. The rate freeze was placed on hold until a full hearing could take place on its potential effects. However, the judge allowed the elimination of the intrastate subscriber line charges as provided by the law. In response to the ruling, Ameritech and Verizon appealed to the 6th District Court of Appeals in Cincinnati. On September 28, 2000, the federal appeals court issued an injunction allowing Ameritech and Verizon to continue charging the access fee until a full hearing and decision could be made.

In August 2002, then Governor Engler announced a settlement with SBC/Ameritech concerning access fees and local phone rates. Concerned that the court cases had been drawn out for too long, the Governor and SBC/Ameritech agreed to a continuation of access fees, but at a reduced rate from current charges. SBC/Ameritech will reduce access fees from \$3.28 per month to \$2.78 per month saving residential customers with one line \$6 annually or a total of \$29 million for all residential users. The agreement will also lift the rate freeze provided for in the 2000 MTA. Judge Borman approved the settlement in December 2002. Verizon also settled with the state on December 31, 2002.

According to the MPSC, there is a connection between the subscriber line charges settlement and SBC and Verizon's acceptance of the provisions of 2002 PA 48 (see section on Broadband).

The MPSC has issued orders implementing the adjacent local calling areas provision. MPSC defines local calling areas as the home exchange to which a customer's phone line is assigned as shown by maps and descriptions prepared by the customer's local telephone service provider in that provider's tariffs. MPSC required local phone service providers with more than 250,000 telephone users to expand intraLATA² local calling areas no later than October 31, 2001 and interLATA local calling areas by August 31, 2002.

Companies serving less than 250,000 telephone users were exempt from the adjacent calling areas provision. However, several smaller companies have approached MPSC with customer requests to consider calls made to adjacent calling areas as local calls. Companies asking to provide expanded local calling areas have also requested a rate increase to cover costs of the expanded service. MPSC has approved several requests for exempted companies.

The MTA, as amended in 2000, is set to repeal December 31, 2005.

Broadband

In February and March 2002, the House and Senate Technology Committees worked on Broadband legislation. Broadband describes high speed data transfer (at least 200 kilobits per second) provided by any one of several technologies; dig-

ital subscriber line (DSL), cable modem, terrestrial wireless, satellite, and fiber-optics. Many in the telecommunications industry believe that widespread access to broadband services are imperative for the economic well being of the state and the prosperity of Michigan's residents.

The Metropolitan Extension Telecommunication Rights-of-Way Oversight (METRO) Act (PA 48 of 2002), creates an oversight authority with the power to assess and collect ROW fees and distribute them to local units of government. METRO established a uniform fee for rights-of-way (ROW) access across the state for both telephone and cable companies. Previously, only cable companies paid ROW fees, and fees across the state were disparate. METRO set a uniform fee at 5 cents per foot. The Michigan Broadband Development Authority Act (PA 49 of 2002) creates the Michigan Broadband Development Authority and provides it with the power to make loans to and enter into joint partnerships with broadband developers. Public Act 50 of 2002 amends PA 282 of 1905 and provides property tax exemptions to telecommunications companies for equipment that is used to deliver broadband services.

Federal Legislation

The federal Telecommunications Act of 1996 was the first comprehensive rewrite of the Federal Communications Act of 1934 and changed the rules for competition and regulation in all sectors of the communications industry. The federal Telecommunications Act overrules all state restrictions on competition in local and long-distance phone service. The Act

² LATA refers to the Local Access and Transport Area - the geographic area in which a local exchange carrier is permitted to provide service. IntraLATA calls are those calls that remain within the geographic area. InterLATA calls are calls placed from one geographically defined area to another. At one time, area codes followed LATA lines. Now, however, you can have more than one area code within a LATA.

also establishes new universal service rules to continue subsidization of telephone service for rural and low-income subscribers and assist schools, libraries, and other public institutions in becoming connected to sophisticated telecommunications services. Local telephone companies are free to provide long-distance service outside their regions immediately, and inside their regions once barriers to local telephone competition are removed. The Act relaxes the rules governing cable television systems. It removes the rate regulation requirements (by March 31, 1999) on all cable services except for the basic tier services including over-the-air channels and public and educational channels.

Cable television, though not a public utility in the strictest sense, is subject to regulatory oversight. The federal government, through the Federal Communications Commission (FCC) regulates cable services and access to cable networks. Local units of government negotiate franchise agreements with cable providers to deliver cable services within their jurisdictions. Cable providers are gaining increasing flexibility to set service prices. Customers hope to gain some choice both in the level of service and provider. Technology for receiving and delivering video signals will have a significant impact on the cable industry and its customers. Many cable TV providers also offer broadband internet services over their coaxial cables.

Area codes are the designation of a three digit number preceding the seven digit phone number designed by AT&T and Bell Laboratories in 1947. In 1991, 119 area codes

were in service in the United States. By June of 1999, 215 area codes were in service and an anticipated 70 more would be needed by 2001. In addition to the area code, a telephone number consists of a three-digit exchange and a four-digit number, which is individualized per phone line.

The 1996 Federal Telecommunications Act requires telephone companies to have telephone numbers before they can provide service. Telephone numbers are assigned to telephone companies in blocks of 10,000.

Mathematically, there are 10,000 combinations of an area code within a specific exchange. Each area code (for example, 248) has a possible combination of 7,920,000 telephone numbers. Handed out in blocks of 10,000, this allows for 792 blocks to be issued with the area code 248. Many companies may not need 10,000 telephone numbers to begin serving customers. For this reason, large quantities of numbers may be assigned, but unused by the telephone company. The large influx of new service providers (including cellular phone and internet access providers) into the industry means that more and more blocks of telephone numbers are assigned to different companies that may not use all their assigned numbers.

Congress gave the FCC authority over telephone number administration in 1996. The FCC established the North American Numbering Plan Administrator (NANA) to oversee day-to-day operations of telephone numbering. The North American Numbering Plan Council (NANC) advises the FCC on number administration issues

and is made up of industry, consumer advocates, and state regulators. The Plan Administrator will determine when an area is running out of telephone numbers and convene the Plan Council to develop and implement a plan for the area needing new numbers. The Council will recommend a new area code distribution based on *geographical split* or *overlay*.

A geographical split means that an area with one area code is split into two or three sections. One section retains the existing area code while the other one or two receive new area codes. A geographical split is beneficial in that the area code still says something about the geographical location of the telephone number. However, it can be expensive for business customers who must reprint letterhead and business cards and otherwise advertise a new phone number.

An overlay avoids the business expense by assigning the new area code only to new phone lines within the same geographical area as the existing area code. Customers in cities where area codes overlay are required to dial all ten digits for local calls. Additionally, it is possible for customers to have two phone lines with different area codes or homes within the same geographic area may have the same phone number with different area codes.

At one time, all authority for assigning area codes resided at the federal level. However, the FCC has delegated to the states the authority to decide when and in what form to introduce new area codes.